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BRIEF NOTE

DIAGNOSIS AND PHYLOGENETIC RELATIONSHIPS OF THE MONOTYPIC GENUS *STETHOLIODES* (COLEOPTERA: LEIODIDAE)[1]

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Seventy years have passed since the only known specimen of *Stetholiodes laticollis* was discovered by Blatchley in northeastern Indiana and described by Fall (see Blatchley 1910, Fall 1910). No additional specimens have been collected, and the relationships of this curious beetle to other North American Leiodinae (Leiodidae) has remained obscure. Both Blatchley and Fall were initially impressed by an apparent similarity of this beetle to species of the genus *Leiodes* (referred to at that time as "*Anisotoma*"), but upon further study concluded that actual relationships were with *Anisotoma* (then called "*Liodes*"). After examining the holotype, I believe that my predecessors were misled by symplesiomorphic characters and that certain synapomorphic characters support placement of this beetle in or near *Agathidium*. The purpose of this note is to briefly reconsider this intriguing species, including a description of the male genitalia, and to discuss my opinions in regard to the natural relationships of *Stetholiodes* to other North American leiodid beetles.

The holotype was borrowed from the Museum of Comparative Zoology, Harvard University. The specimen was relaxed in Barber's fluid, studied in a deep-depression slide by compound microscopy, and remounted. The aedeagus was dissected out, studied, and is presently stored in a microvial of glycerin attached to the pin of the specimen. Dissection and general methods follow those cited previously (Wheeler 1979a, 1979b). Drawings were prepared with a drawing-tube attached to a Wild M-3 dissecting microscope and a Wild M-12 compound microscope.

Taxonomic Considerations

While a number of sound diagnostic characters of *S. laticollis* and a lengthly description of the species given by Fall (1910) make its redescription presently superfluous, it would be useful to add to the diagnosis and to include characters of the aedeagus previously unexamined. A new and enlarged description will be called for if and when the species is rediscovered.

Stetholiodes laticollis Fall

Stetholiodes laticollis Fall, 1910:4; Blatchley, 1910:288; Wheeler, 1979a: 261.

Type locality: USA, Indiana, Steuben County (May 25, 1909).

Type depository: Museum of Comparative Zoology, Harvard University, in H.C. Fall Collection.

Diagnostic combination—Body form elongate-oval (fig. 4); elytra with 9 complete, punctate interneurs (terminology of Erwin 1974); mesosternum nearly horizontal (not elevated-laminiform); antennal club consists of abruptly enlarged segments IX, X, and XI (fig. 1), segment VII is larger than VIII but smaller than apical three; pronotum broad (fig. 5); postocular tempora not well-developed (fig. 3); apical segment of maxillary palpus acicular (fig. 2); aedeagus (figs. 6–8) with median lobe (ml) narrowed at apex, ventral piece (vp) deeply emarginate medially, parameres (p) sinuate near apex, endophallus (en) with medial spine (ms) and a pair of small, serrate sclerites (ss).

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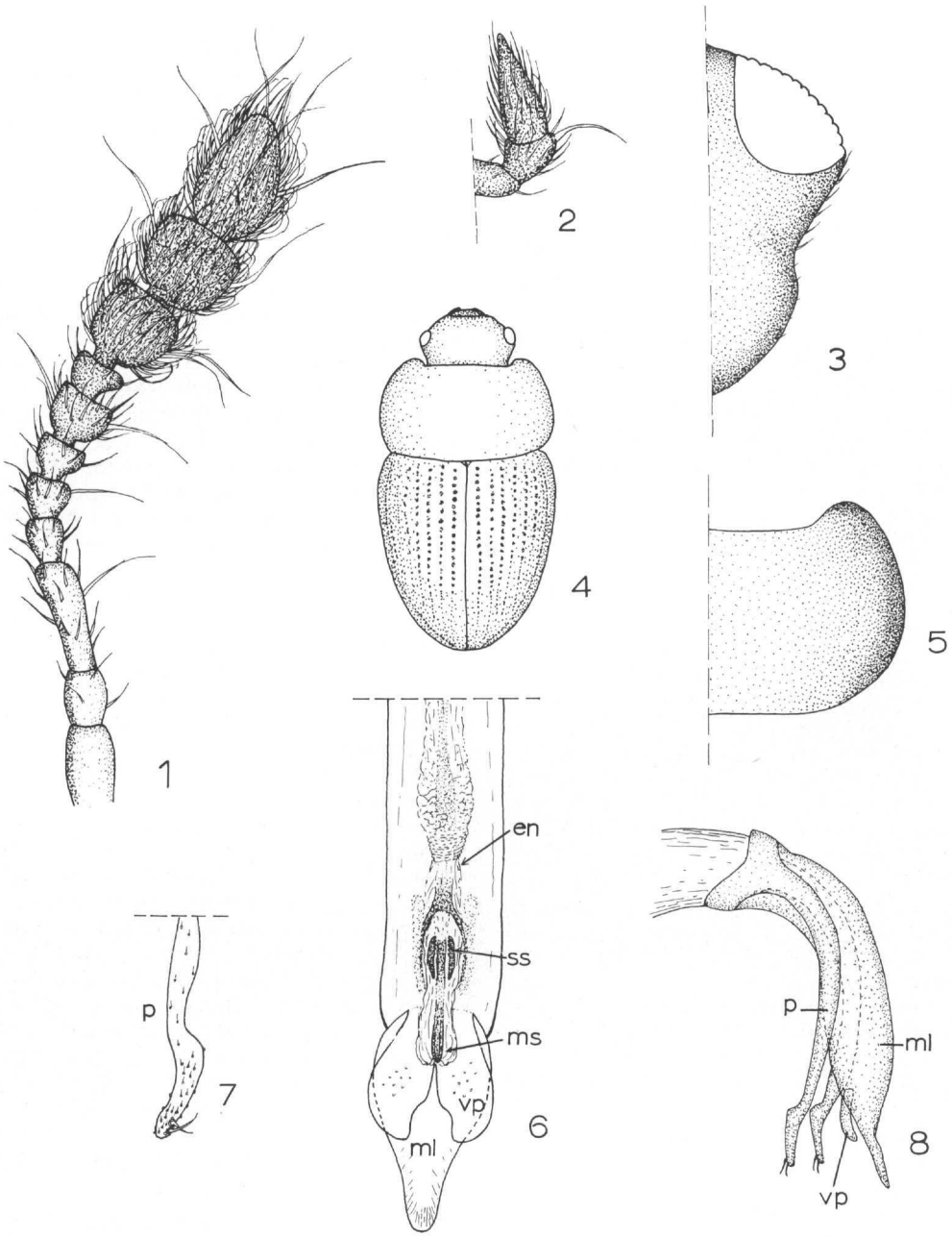

FIGURES 1–8. *Stetholiodes laticollis:* fig. 1, antenna; fig. 2, apex maxillary palpus; fig. 3, lateral margin of head (ventral view); fig. 4, habitus (dorsal view); fig. 5, right half pronotum (dorsal view); fig. 6, apex of median lobe (ventral view); fig. 7, apex of paramere (lateral view); fig. 8, aedeagus (lateral view). Drawings not to scale.

Relationships of *Stetholiodes*

Until a broad cladistic analysis is completed for the genera of Leiodinae, or at least Agathidiini, a detailed account of inter-generic relationships is problematical because data concerning character polarities are lacking. Nonetheless, an examination of the characters previously used in evaluations of the relationships of *Stetholiodes* indicates that they were symplesiomorphies and therefore ineffectual. I have made a cursory look at several characters and made inferrences about their polarities among *Stetholiodes* and related genera (i.e., *Anisotoma* and *Agathidium*). I have previously speculated on ties between *Stetholiodes* and *Agathidium* (Wheeler 1979a, p. 261), and expand upon the supportive apomorphic characters below.

Antennae.—Structure of the antennae of *Stetholiodes* has caused some confusion. Descriptions of the antennae indicate that segment VII is larger than VIII (Fall 1910, Blatchley 1910), and thus the genus is usually keyed-out as having a 5-segmented club (Brown 1971, Hatch 1929). The structure of the antennae (fig. 1), however, is very similar to that of some species of *Agathidium* (*e.g.*, *A. depressum*, see Fall 1934). I would (subjectively) interpret the club as being 3-segmented (an apparent apomorphy for the genus *Agathidium*) since antennal segments IX, X, and XI are very abruptly enlarged, and are distinctly larger than VII. Although VII is larger than VIII, it is not inordinately so for *Agathidium*.

Aedeagus.—Judgements about polarity of aedeagal structures are particularly hard to make because no broad surveys of these have been made, although Hlisnikovsky (1964) does illustrate the genitalia of many species. It is likely that some of the noted modifications are of less than generic significance.

Curvature of the parameres does not frequently occur in the genus *Anisotoma* (Wheeler 1979a) and can reasonably be regarded as apomorphic where it occurs in *Agathidium* and in *Stetholiodes*. There seems to be a basic phenetic similarity in the types of modifications found in *Stetholiodes* to those seen in certain *Agathidium* [shapes of median lobe, ventral piece, parameres, and small endophallic armature], but firm synapomorphies cannot yet be recognized.

Maxillary palpus.—Acicular segments of the maxillary palpus do occur elsewhere, in *Agathidium* (*e.g.*, *A.* sp. from Malaysia).

Elytral interneurs.—The presence of 9 complete, punctate elytral interneurs is plesiomorphic. They are known in various genera of the subfamily (Wheeler 1979a), and their occurrence in both *Stetholiodes* and *Anisotoma* is symplesiomorphic.

Postocular tempora.—Many *Agathidium* beetles have well-developed postocular tempora (*e.g.*, fig. 2 *in* Wheeler 1977), which are interpreted as apomorphic. They are absent in some other *Agathidium* species (*e.g.*, *A. sexstriatum*), in all *Anisotoma* beetles, and in *Stetholiodes*; this absence is therefore symplesiomorphic.

In my paper on *Anisotoma* (Wheeler 1979a), I indicated in error that *Stetholiodes* has well-developed postocular tempora. The character linking *Stetholiodes* to *Agathidium* that I should have cited was the 3-segmented antennal club.

Based on these structural considerations, I suggest that *Stetholiodes* is closely related to *Agathidium*, and, in fact, could be synonymous with that genus. In particular, the small endophallic armature, curvature of the parameres, and abrupt enlargement of the apical three antennal segments support this conclusion. If we ignore plesiomorphic structures of the head (absence of well-developed postocular tempora) and elytra (punctate interneurs) that resemble conditions found in *Anisotoma*, *Stetholiodes* does look very much like some species of *Agathidium* having a broadly ovate body-form and punctate elytra (*e.g.*, *A. depressum* and related species).

Ecological Relationships

Very little is known about the biology of *Stetholiodes*. Blatchley (1910) collected the type specimen from Sphagnum moss in northern Indiana. Many *Agathidium* (adults and larvae) are known to be associated with various slime-molds (Myxomycetes) and fungi

(Benick 1952, Russel 1979), and it would seem reasonable to search for *Stetholiodes* in similar situations.

Because no evidence presently indicates a sister-group relationship between *Stetholiodes* and some subunit of *Agathidium*, it would be unwarranted to synonymize these genera now (*e.g.*, sister-group relationship of these taxa at the generic level cannot be ruled out; although intuitively it seems unlikely). My analysis emphasizes the apparent relationship of *Stetholiodes* with species of *Agathidium* (particularly *A. depressum* and related species), and should help in identification of any additional specimens that might be collected. More detailed analyses of ecology, structure, and relationships will be possible only when more specimens are discovered, and future studies of *Agathidium* beetles should include a consideration of *Stetholiodes* in an effort to further refine our understanding of its relationships.

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